News Release

February 18, 2022
JX Nippon Mining & Metals Corporation

Participation in the Japan Technological Research Association of Artificial Photosynthetic Chemical Process
—Contributing to Society-wide Decarbonization
by Accelerating Development of Catalysts for Artificial Photosynthesis—

JX Nippon Mining & Metals Corporation (President: Murayama Seiichi; "the Company") has been developing materials for artificial photosynthesis for some time. To accelerate these efforts and translate them into practical applications, it will participate in Phase 2 activities of the Japan Technological Research Association of Artificial Photosynthetic Chemical Process (ARPChem).

As well as using solar energy and catalysts to split water into hydrogen and oxygen, artificial photosynthesis technology causes a reaction of hydrogen and carbon dioxide (CO_2) to generate fuel and chemical raw materials. Japan is a world leader in developing such technology, and as efforts to achieve carbon neutrality speed up worldwide, interest is growing in artificial photosynthesis as a technology for creating green hydrogen.[1]

In the aim of achieving carbon neutrality, at the same time as reducing CO_2 emissions within the JX Nippon Mining & Metals Group, the Company is developing cutting-edge materials that contribute to decarbonization throughout society, and striving to develop materials for artificial photosynthesis from this perspective. Specifically, since June 2021 the Company has conducted joint research with the Shinshu University laboratory of Professor Kazunari Domen, a leading expert on artificial photosynthesis catalysts, and under developing ground-breaking catalysts by providing our proprietary technologies including those relating to high-purity metals, crystallization, and powder control.

ARPChem is a research association formed under the leadership of the Ministry of Economy, Trade and Industry in the aim of developing artificial photosynthesis technologies for industrial applications. Its Phase 1 activities, conducted from fiscal 2012 to fiscal 2021, produced results that included launching the world's first artificial photosynthesis pilot projects. Over the next 10 years, leading Japanese companies and research institutions[2] will bring their specialist technologies to Phase 2 activities, and develop technologies focused on practical implementation aligned with the themes of catalyst development, hydrogen separation membrane development, and safety trials. By providing high-purity metals such as tantalum and titanium as well as various technologies it has devised, the Company will contribute to development of catalysts that help to enhance solar energy conversion efficiency. These activities form part of the Green Innovation Funding Program launched by the New

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Energy and Industrial Technology Development Organization.

The Company will proactively strive to develop new products together with its partners and contribute to realizing a sustainable society.

1. Hydrogen produced by splitting water. Using renewable energy in the splitting process enables hydrogen to be produced without emitting CO_2 as a by-product.
2. Companies and research institutions participating in ARPChem.

Companies	JX Nippon Mining & Metals Corporation, Mitsubishi Chemical Corporation, Dai Nippon Printing Co., Ltd., Toyota Motor Corporation, Nippon Steel Corporation, Furuya Metal Co., Ltd., Mitsui Chemicals, Inc., Inpex Corporation, Dexerials Corporation, Toray Industries, Inc. (no particular order)
Research institutions	The University of Tokyo, Shinshu University, Tokyo University of Science, Kyoto University, Tohoku University, Nagoya University, Yamaguchi University, National Institute of Advanced Science and Technology (no particular order)

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